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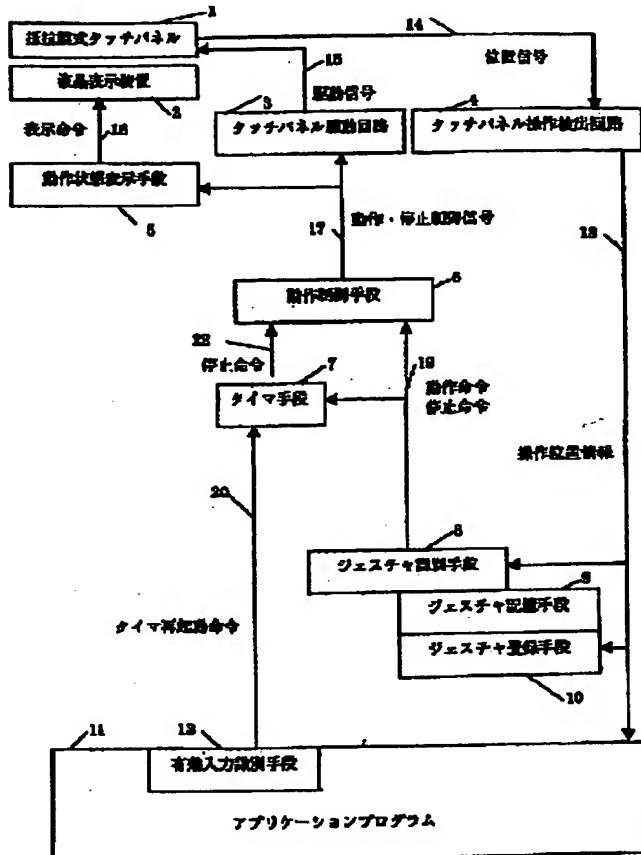
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APPLICANT : MATSUSHITA ELECTRIC IND CO LTD;

INVENTOR : TAKAOKA HIROSHI;

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TITLE : PORTABLE TERMINAL HAVING  
 TOUCH PANEL



**ABSTRACT :** PROBLEM TO BE SOLVED: To provide a portable terminal which can surely and pleasantly apply an input operation of a touch panel.

**SOLUTION:** A touch panel control part of a portable terminal includes a gesture register means 10 which registers a simple operation as a gesture to a specific area of a touch panel 1, a gesture identification means 8, a valid input identification means 13, a timer means 7, a touch panel action control means 6 and an operating state display means 5 which displays an input received from the panel 1. Then a gesture that validates an input operation is identified, and the input operation of the panel 1 is validated, while a gesture that invalidates an input operation is identified and the input operation is invalidated. When the means 7 detects that no valid input operation is given from the panel 1 for a fixed time, input operation is invalidated until a gesture to validate an input operation is detected. Thus, the valid/invalid control of the panel 1 is attained by an instruction given in a simple gesture.

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WPI / DERWENT

AN - 1999-483479 [41]

AP - JP19980017686 19980114

PR - JP19980017686 19980114

TI - Portable terminal equipment with touch panel - has override unit which overrides input operation from touch panel depending on result of identification of gesture from gesture identification unit

IW - PORTABLE TERMINAL EQUIPMENT TOUCH PANEL OVERRIDE UNIT OVERRIDE INPUT OPERATE TOUCH PANEL DEPEND RESULT IDENTIFY IDENTIFY UNIT

PA - (MATU ) MATSUSHITA DENKI SANGYO KK

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IC - G06F3/00 ; G06F3/033 ; H04M1/02 ; H04M1/23 ; H04Q7/38

FS - EPI

DC - T01 W01

AB - JP11203045 NOVELTY - A gesture identification unit (8) identifies the effective input operation from the touch panel (1) or the gesture made to override. An override unit overrides the input operation from the touch panel depending on the result of identification of gesture. The gesture is a simple operation opposing to a specific area of the touch panel. DETAILED DESCRIPTION - A gesture registration unit (10) registers the gesture into the touch panel control unit of the portable terminal equipment.

- USE - None given.

- ADVANTAGE - Ensures user of reliable and comfortable operation since the touch panel can be switched between effective operation and operation stoppage by operation on the touch panel. Prevents misoperation due to e.g. unprepared movement since the operation of the touch panel is stopped automatically when there is no effective input for a fixed time. Easy to use since the automatic stopping time of the touch panel operation is changeable depending on operation scene. DESCRIPTION OF DRAWING(S) - The figure is a block diagram showing the components of the portable terminal equipment. (1) Touch panel; (8) Gesture identification unit; (10) Gesture registration unit.

\* NOTICES \*

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[The technical field to which invention belongs] this invention relates to the personal digital assistant equipment which changes effective/invalid of operation of a touch panel by gesture especially about the personal digital assistant equipment which has a touch panel.

#### [0002]

[Description of the Prior Art] While displaying various kinds of information, a screen is touched with a touch pen, a finger, etc., personal digital assistant equipment is operated or there are some which carried the touch panel for performing a data input etc. in personal digital assistant equipment. The composition of the touch panel of conventional personal digital assistant equipment is shown in drawing 3 . In drawing 3 , the resistance film type touch panel 1 is equipment which detects the position which touched the screen with the finger, the pen, etc. A liquid crystal display 2 is equipment which displays a character and a picture. The touch-panel drive circuit 3 is a circuit which generates the driving signal 15 which carries out the scan of the resistance film type touch panel 1. The touch-panel operation detector 4 is a circuit which detects the position signal 14 from the resistance film type touch panel 1, and changes into the actuated-valve-position information 18 whether it is under positional information and operation (\*\* NDAUN state) and in the state (pen rise state) which is not operated.

[0003] Operation of the conventional personal digital assistant equipment shown in drawing 3 is explained. Drive control is carried out by the touch-panel drive circuit 3, and the resistance film type touch panel 1 tells a user's touch-panel actuated valve position to the touch-panel operation detector 4 as a position signal 14. The touch-panel operation detector 4 changes into the actuated-valve-position information 18 whether it is under positional information and operation (\*\* NDAUN state) and in the state (pen rise state) which is not operated about a position signal 14. A liquid crystal display 2 displays tracing, the character by the application program 11, and drawing of touch-panel operation by the application program 11. If personal digital assistant equipment is working, alter operation is always possible for the touch panel of such conventional personal digital assistant equipment.

[0004] Moreover, the switch which changes operation of a touch panel effectively or invalid is equipped apart from a touch panel, carelessly, data are inputted from a touch panel and there is also a thing which can be prevented from malfunctioning.

#### [0005]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional personal digital assistant equipment, when personal digital assistant equipment was working, and the user was fully careful and did not operate it, there were an incorrect input by the hand of holding personal digital assistant equipment, and an incorrect input by touching other objects, and operability was bad. Moreover, even if it was personal digital assistant equipment equipped with the switch which can confirm operation of a touch panel or can be repealed, there was inconvenience of operation of a switch being troublesome or forgetting the switch operation which repeals operation of a touch panel.

[0006] this invention solves the above-mentioned conventional trouble, and aims at offering the outstanding personal digital assistant equipment which makes alter operation by the touch panel

simply and reliable, and can use it comfortably. [0007]

[Means for Solving the Problem] A gesture registration means to register as gesture the simple operation to the specific field of the touch panel arbitrarily set as the touch-panel control section of personal digital assistant equipment in this invention in order to solve the above-mentioned problem, A gesture discernment means to discriminate the gesture which makes alter operation from a touch panel effectively or invalid, A terminal operation scene selection means to discriminate the scene of personal digital assistant equipment of operation, and a timer means to detect that there is no effective alter operation from a touch panel fixed time, It considered as the composition possessing the motion-control means which repeals alter operation from a touch panel until it confirms touch-panel operation or the gesture to confirm is newly detected, and an operating state display means to indicate whether it is impossible whether it can input from a touch panel.

[0008] Thus, by having constituted, effective invalid control of the touch panel according to the operating condition of personal digital assistant equipment can be realized, and the outstanding personal digital assistant equipment which a user can operate certainly and comfortably can be offered.

[0009]

[Embodiments of the Invention] In the personal digital assistant equipment with which invention of this invention according to claim 1 carried the touch panel A gesture registration means to register as gesture the simple operation to the specific field of the aforementioned touch panel set up arbitrarily, A gesture discernment means to discriminate the gesture which makes alter operation from the aforementioned touch panel effectively or invalid, It is personal digital assistant equipment with a touch panel which established the means which makes alter operation from the aforementioned touch panel effectively or invalid according to the result which discriminated gesture. It has operation of controlling the effective invalid of touch-panel operation, by registering the gesture for controlling the effective invalid of touch-panel operation by liking of a user, and operating the registered gesture.

[0010] Invention of this invention according to claim 2 is set to personal digital assistant equipment with a touch panel according to claim 1. A means to register into the aforementioned gesture registration means the gesture which confirms alter operation from the aforementioned touch panel according to the scene of personal digital assistant equipment of operation is established. A means to discriminate the gesture which confirms alter operation from a touch panel for the aforementioned gesture discernment means according to the scene of personal digital assistant equipment of operation is established, and it has operation of controlling the effective invalid of operation by the gesture according to the scene of operation.

[0011] In a claim 1 and the personal digital assistant equipment with a touch panel of two publications, invention of this invention according to claim 3 has operation of repealing operation of a touch panel automatically, when a means to detect that there is no effective alter operation from the aforementioned touch panel fixed time is established and there is no effective alter operation fixed time.

[0012] Invention of this invention according to claim 4 is set to a claim 1 and the personal digital assistant equipment with a touch panel of two publications. A means to detect that there is no effective alter operation from the aforementioned touch panel fixed time according to the state of a personal digital assistant machine, The means which repeals alter operation from the aforementioned touch panel is established until the gesture which confirms alter operation from the aforementioned touch panel is newly detected, and it has operation of repealing touch-panel operation according to a scene of operation.

[0013] In personal digital assistant equipment with a touch panel according to claim 1 to 4, invention of this invention according to claim 5 establishes a means to indicate whether the alter operation from the aforementioned touch panel is unable to be possible, and has operation that the effective invalid of operation of the present touch panel is shown to a user.

[0014] Invention of this invention according to claim 6 the simple operation to the specific field of the touch panel set up arbitrarily The alter operation from the aforementioned touch panel is registered according to the scene of personal digital assistant equipment of operation as gesture made effectively or invalid. The gesture which makes alter operation from the aforementioned touch panel

effectively or invalid is discriminated according to the scene of personal digital assistant equipment of operation. It is the control method of the personal digital assistant equipment with a touch panel which makes alter operation from the aforementioned touch panel effectively or invalid according to the result which discriminated gesture, and has operation of controlling the effective invalid of operation by the gesture according to the scene of operation.

[0015] Invention of this invention according to claim 7 is set to the control method of personal digital assistant equipment with a touch panel according to claim 6. It detects that there is no effective alter operation from the aforementioned touch panel fixed time. When alter operation from the aforementioned touch panel is repealed and there is no effective alter operation fixed time until the gesture which confirms alter operation from the aforementioned touch panel is newly detected, it has operation of repealing operation of a touch panel automatically.

[0016] Hereafter, the gestalt of operation of this invention is explained in detail with reference to drawing 1 and drawing 2.

[0017] (Gestalt 1 of operation) The gestalt of operation of the 1st of this invention is personal digital assistant equipment with a touch panel which prepared a gesture registration means, the gesture discernment means, the timer means, the motion-control means, and the operating state display means in the touch-panel control section.

[0018] Drawing 1 is the block diagram showing the composition of the 1st of the personal digital assistant equipment of the gestalt of operation of this invention. In drawing 1, the resistance film type touch panel 1 is equipment which detects the position which touched the screen with the finger, the pen, etc. A liquid crystal display 2 is equipment which displays a character and a picture. The touch-panel drive circuit 3 is a circuit which generates the driving signal 15 which carries out the scan of the resistance film type touch panel 1. The touch-panel operation detector 4 is a circuit which detects the position signal 14 from the resistance film type touch panel 1, and changes into the actuated-valve-position information 18 whether it is under positional information and operation (\*\* NDAUN state) and in the state (pen rise state) which is not operated. The operating state display means 5 is a means to display on a position whether a display instruction 16 can be given to a liquid crystal display 2, and it can input into it from the resistance film type touch panel 1. The motion-control means 6 is a means to output operation / halt control signal 17 to the touch-panel drive circuit 3 and the operating state display means 5.

[0019] The timer means 7 is a means to output stop instruction 22 to the motion-control means 6, when the deadline of the appointed time is clocked and passed. The gesture discernment means 8 is a means to detect the predetermined operation to the resistance film type touch panel 1 based on the actuated-valve-position information 18. The gesture storage means 9 is memory which memorizes the predetermined operation to the resistance film type touch panel 1. The gesture registration means 10 is a means to store the predetermined operation to the resistance film type touch panel 1 in the gesture storage means 9. An application program 11 is a program for realizing the various functions of personal digital assistant equipment. The effective input discernment means 13 is a means to output the timer reboot instruction 20 to the timer means 7, when there is an effective input to the resistance film type touch panel 1.

[0020] Operation of the personal digital assistant equipment of the gestalt of operation of the 1st of this invention constituted as mentioned above is explained with reference to drawing 1. First, fundamental operation is explained. Drive control is carried out by the touch-panel drive circuit 3, and the resistance film type touch panel 1 tells a user's touch-panel actuated valve position to the touch-panel operation detector 4 as a position signal 14. The touch-panel operation detector 4 changes into the actuated-valve-position information 18 whether it is under positional information and operation (\*\* NDAUN state) and in the state (pen rise state) which is not operated about a position signal 14. A liquid crystal display 2 displays tracing, the character by the application program 11, and drawing of touch-panel operation by the application program 11.

[0021] Next, operation which registers gesture is explained. A user decides the arbitrary fields of the resistance film type touch panel 1 to be gesture input areas, and decides the simple operation (for example, operation which carries out a double-tap) to the field to be gesture. At this time, the gesture which confirms alter operation from the resistance film type touch panel 1 is decided. If personal digital assistant equipment is set as gesture registration mode, since it will be displayed [ "please

"input gesture" and ] on a liquid crystal display 2, gesture operation is performed to a gesture input area. The gesture registration means 10 stores the actuated-valve-position information 18 (positional information and time series information on an operation state) on the gesture in the gesture storage means 9 as a gesture pattern. After registration of gesture finishes, a user cancels the gesture registration mode of personal digital assistant equipment. Now, gesture registration is ended.

[0022] Next, operation which discriminates gesture and suspends alter operation is explained. In the normal operating state of personal digital assistant equipment, the gesture discernment means 8 supervises the actuated-valve-position information 18, and compares it with the gesture pattern of an input halt memorized by the gesture storage means 9. Nothing is carried out if not in agreement. If the gesture pattern of the actuated-valve-position information 18 and an input halt is in agreement, the gesture discernment means 8 will output stop instruction 19 to the motion-control means 6 and the timer means 7. The motion-control means 6 outputs operation / halt control signal 17 to the touch-panel drive circuit 3 and the operating state display means 5. The touch-panel drive circuit 3 stops a normal driving signal, outputs only the driving signal 15 for gesture surveillance to the resistance film type touch panel 1, and stops normal operation. The motion-control means 6 outputs a display instruction 16 to a liquid crystal display 2, and displays on a liquid crystal display 2 that it is the idle state which cannot be inputted from the resistance film type touch panel 1. The timer means 7 is made into a idle state. An application program 11 will be in a idle state, and suspends the input of the actuated-valve-position information 18.

[0023] Next, operation which discriminates gesture and resumes alter operation is explained. In the idle state of personal digital assistant equipment of operation, the gesture discernment means 8 discriminates the gesture which confirms alter operation from the resistance film type touch panel 1. The gesture discernment means 8 reads gesture from the gesture storage means 9. The actuated-valve-position information 18 is supervised and it compares with a gesture pattern. Nothing is carried out if not in agreement. If the actuated-valve-position information 18 and a gesture pattern are in agreement, the gesture discernment means 8 will output the instruction 19 of operation to the motion-control means 6 and the timer means 7. The motion-control means 6 outputs operation / halt control signal 17 to the touch-panel drive circuit 3 and the operating state display means 5. The touch-panel drive circuit 3 outputs a driving signal 15 to the resistance film type touch panel 1, and starts normal operation. The motion-control means 6 outputs a display instruction 16 to a liquid crystal display 2, and displays on a liquid crystal display 2 that it is the normal operating state which can be inputted from the resistance film type touch panel 1. The timer means 7 is rebooted from a idle state. An application program 11 returns to normal operating state from a idle state, and resumes the input of the actuated-valve-position information 18.

[0024] Next, when there is no fixed time input, operation which suspends an input is explained. Alter operation from the resistance film type touch panel 1 is repealed until it detects that the effective input discernment means 13 does not have the effective alter operation from the resistance film type touch panel 1 fixed time and the gesture which newly confirms operation is detected. The effective input discernment means 13 supervises the actuated-valve-position information 18, and if it judges that it is an effective input, it will output the timer reboot instruction 20 to the timer means 7. The timer means 7 inputs the scene information from the terminal operation scene selection means 12, and sets up counted value. If the timer means 7 reaches the counted value which counted and set up the clock signal, it will output stop instruction 22 to the motion-control means 6. Operation after this is the same as a halt by gesture. If the timer reboot instruction 20 is inputted before reaching the set-up counted value, a count will be performed from the beginning. Therefore, if there is no effective input over the fixed time, it will stop.

[0025] As mentioned above, since it considered as the composition which prepared a gesture registration means, the gesture discernment means, the timer means, the motion-control means, and the operating state display means in the touch-panel control section of personal digital assistant equipment with a touch panel according to the form of operation of the 1st of this invention, a halt of a touch panel of operation and directions of resumption of operation can be performed in operation of the touch panel itself, and a user can operate a touch panel simply and certainly.

[0026] (Form 2 of operation) The form of operation of the 2nd of this invention is personal digital assistant equipment with a touch panel which prepared a gesture registration means, a gesture

discernment means, the terminal operation scene selection means, the timer means, the motion-control means, and the operating state display means in the touch-panel control section. The place where the form of the 2nd operation differs from the form of the 1st operation is a point which discriminates and controls gesture according to the scene of a terminal of operation.

[0027] Drawing 2 is the block diagram showing the composition of the 2nd of the personal digital assistant equipment of the form of operation of this invention. Fundamental composition is the same as the form of operation of the 1st of drawing 1. The terminal operation scene selection means 12 is a means for a terminal to generate the scene information 21 which shows in what scene it is operating now, and to output to the timer means 7 and the gesture discernment means 8.

[0028] Operation of the personal digital assistant equipment of the form of operation of the 2nd of this invention constituted as mentioned above is explained with reference to drawing 2. Fundamental operation is the same as the form of the 1st operation.

[0029] Operation which registers gesture is explained. A user decides the arbitrary fields of the resistance film type touch panel 1 to be gesture input areas, and decides the simple operation (for example, operation which carries out a double-tap) to the field to be gesture. At this time, the gesture which confirms alter operation from the resistance film type touch panel 1 is decided according to the scene of personal digital assistant equipments, such as an "item selection scene", a "character selection scene", and "an input scene of a handwriting character and a picture", of operation. If personal digital assistant equipment is set as gesture registration mode, since it will be displayed [ "please input the gesture of an item selection scene", and ] on a liquid crystal display 2, gesture operation according to the scene of operation is performed to a gesture input area. The gesture registration means 10 stores the actuated-valve-position information 18 (positional information and time series information on an operation state) on the gesture in the gesture storage means 9 as a gesture pattern for every scene of operation. This is repeated about all scenes of operation. After registration of the gesture of all scenes of operation finishes, a user cancels the gesture registration mode of personal digital assistant equipment. Now, gesture registration is ended.

[0030] Next, operation which discriminates gesture and suspends alter operation is explained. In the normal operating state of personal digital assistant equipment, the gesture discernment means 8 supervises the actuated-valve-position information 18, and compares it with the gesture pattern of an input halt memorized by the gesture storage means 9. Nothing is carried out if not in agreement. If the gesture pattern of the actuated-valve-position information 18 and an input halt is in agreement, the gesture discernment means 8 will output stop instruction 19 to the motion-control means 6 and the timer means 7. The motion-control means 6 outputs operation / halt control signal 17 to the touch-panel drive circuit 3 and the operating state display means 5. The touch-panel drive circuit 3 stops a normal driving signal, outputs only the driving signal 15 for gesture surveillance to the resistance film type touch panel 1, and stops normal operation. The motion-control means 6 outputs a display instruction 16 to a liquid crystal display 2, and displays on a liquid crystal display 2 that it is the idle state which cannot be inputted from the resistance film type touch panel 1. The timer means 7 is made into a idle state. An application program 11 will be in a idle state, and suspends the input of the actuated-valve-position information 18.

[0031] Next, operation which discriminates gesture and resumes alter operation is explained. In the idle state of personal digital assistant equipment of operation, the gesture discernment means 8 discriminates the gesture which confirms alter operation from the resistance film type touch panel 1 according to the scene of personal digital assistant equipments, such as an "item selection scene", a "character selection scene", and "an input scene of a handwriting character and a picture", of operation. The gesture discernment means 8 inputs the scene information from the terminal operation scene selection means 12, and reads the gesture corresponding to the scene information in a idle state from the gesture storage means 9. The actuated-valve-position information 18 is supervised and it compares with the gesture pattern corresponding to scene information. Nothing is carried out if not in agreement. If the actuated-valve-position information 18 and a gesture pattern are in agreement, the gesture discernment means 8 will output the instruction 19 of operation to the motion-control means 6 and the timer means 7. The motion-control means 6 outputs operation / halt control signal 17 to the touch-panel drive circuit 3 and the operating state display means 5. The touch-panel drive circuit 3 outputs a driving signal 15 to the resistance film type touch panel 1, and starts normal operation. The

motion-control means 6 outputs a display instruction 16 to a liquid crystal display 2, and displays on a liquid crystal display 2 that it is the normal operating state which can be inputted from the resistance film type touch panel 1. The timer means 7 is rebooted from a idle state. An application program 11 returns to normal operating state from a idle state, and resumes the input of the actuated-valve-position information 18.

[0032] Next, when there is no fixed time input, operation which suspends an input is explained. After operation from the resistance film type touch panel 1 is repealed until it detects that the effective input discernment means 13 does not have the effective alter operation from the resistance film type touch panel 1 fixed time according to the state of personal digital assistant machines, such as an "item selection scene", a "character selection scene", and "an input scene of a handwriting character and a picture", and the gesture which newly confirms operation is detected. The effective input discernment means 13 supervises the actuated-valve-position information 18, and if it judges that it is an effective input, it will output the timer reboot instruction 20 to the timer means 7. The timer means 7 inputs the scene information from the terminal operation scene selection means 12, and sets up the counted value corresponding to scene information. If the timer means 7 reaches the counted value which counted and set up the clock signal, it will output stop instruction 22 to the motion-control means 6. Operation after this is the same as a halt by gesture. If the timer reboot instruction 20 is inputted before reaching the set-up counted value, a count will be performed from the beginning. Therefore, if there is no effective input over the time on which it decided for every scene of operation, it will stop. The automatic stay according to the marshaling-yard side is realizable by setting two or more counted value corresponding to scene information as the timer means 7. For example, the time to automatic stay is changeable in the scene where an operation interval is short, like the scenes where an operation interval is comparatively long, such as under a text input, and item selection.

[0033] As mentioned above, since it considered as the composition which prepared a gesture registration means, a gesture discernment means, the terminal operation scene selection means, the timer means, the motion-control means, and the operating-state display means in the touch-panel control section of personal digital assistant equipment with a touch panel according to the gestalt of operation of the 2nd of this invention and a halt of a touch panel of operation and directions of resumption of operation can be performed by the gesture according to the scene of a terminal of operation, a user can operate a touch panel simply and certainly.

[0034]

[Effect of the Invention] To the touch-panel control section which controls the touch panel which is the input section about personal digital assistant equipment by this invention, as mentioned above, a gesture registration means, Since it considered as the composition possessing a gesture discernment means, a device-status discernment means, an operation-less detection means, touch-panel operation effective / invalid control means, and a touch-panel operating state display means The change of effective [ of operation ] and a halt of operation of the touch panel of personal digital assistant equipment with a touch panel can be performed in the operation from the touch panel itself, and the effect that a user can be provided with certain and comfortable operation is acquired.

[0035] Moreover, since it considered as the composition which establishes a gesture registration means register the gesture corresponding to the scene of operation into a gesture storage means beforehand, prepares a terminal operation scene selection means in an application program, and notifies to a gesture discernment means by making the operating state of personal digital assistant equipment into scene information, in this invention, the effect that a touch panel can operate by the simple gesture according to operating state is acquired.

[0036] Moreover, since it considered as the composition which prepares an effective input discernment means in an application program, and establishes a timer means further in this invention, when there is no effective input for fixed time programmed beforehand and an application program, stop instruction can publish for a motion-control means automatically, touch-panel operation can stop automatically, and the effect that the operation mistake by unprepared movement etc. is mitigable is acquired.

[0037] Moreover, in this invention, by programming two or more timer values for a timer means, touch-panel operation automatic stay according to the marshaling-yard side can be realized, and the

effect of becoming easy to use since automatic-stay time is changeable in the scene where an operation interval is short, like the scenes where an operation interval is comparatively long, such as under a text input, and item selection is acquired.

[0038] Moreover, in this invention, a user can check the letter bear of operation of a touch panel visually by adding an operating state display means, and the effect of becoming easier to use is acquired.